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10/727,338	12/03/2003	Akisato Kimura	5259-000036	5281

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EXAMINER	
ARMSTRONG, ANGELA A	
ART UNIT	**PAPER NUMBER**
2626	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,338	KIMURA ET AL.	
	Examiner	Art Unit	
	ANGELA A. ARMSTRONG	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,20-51 and 60-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *41-43,49-51 and 65-67* is/are allowed.

6)☒ Claim(s) *1-15,20-28,32,33,35,36,38-40,44,46-48,60 and 62-64* is/are rejected.

7)☒ Claim(s) *29-31,34,37,45 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/2/08;2/11/08*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed January 2, 2008, in which Applicant has cancelled claims 16-19 and 52-59 and amended claims 1, 12, 20, 41, 49, and 65.

2. The information disclosure statements (IDS) submitted on January 2, 2008, and February 11, 2008, are being considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-15, 20-23, 41-43, 49-51, and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashino et al., ("A Quick search Algorithm for Acoustic Signals Using Histogram Features – Time Series Active Search," Institute of Electronics Information and Communication Engineers of Japan, Vol. J82-D, No. 9, pp. 1365-1373, September 1999, with citations from the English translation) in view of Applicant's Admitted Prior Art.

5. Regarding claim 1, Kashino discloses a signal compression method for compressing an original signal which has been provided in advance to convert the original signal into a compressed signal, comprising: an initial sub-signal creation step of creating sub-signals of the original signal (section 2.1, 2.2-Feature extraction); a created sub-signal selection step of, for

each of the sub-signals which have been produced by the initial sub-signal creation step, pruning the created sub-signal candidates which reduce the amount of data of the compressed signal (2.1, 2.2-Feature Extraction, 2.3-Feature modeling means of histograms; 3.1.2 – Vector quantization); a sub-signal re-creation step of determining upon a created sub-signal which is actually to be used, using the created sub-signal candidates which have been produced by the created sub-signal selection step (2.1, 2.2-Feature Extraction, 2.3-Feature modeling means of histograms); a compression mapping determination step of determining, from the respective sub-signals which have been produced by the sub-signal re-creation step, a mapping for calculation of a compressed signal (2.3-Feature modeling by means of histograms, 3.1.2-Vector quantization); and a signal compression step of calculating a compressed signal which corresponds to each of the sub-signals which have been obtained by the sub-signal re-creation step, based upon the mapping which has been obtained by the compression mapping determination step (2.3-Feature modeling by means of histograms, 3.1.2-Vector quantization). Kashino does not specifically teach the dividing the original signal into the sub-signals in a time domain so as not to overlap with each other or pruning signals that have different lengths which reduce the amount of data of the compressed signal. Applicant's Admitted Prior Art (Specification, page 1, line 22 to page 2, line 11) describes the level of the prior art includes signal retrieval methods, which reduces the cost of calculation for matching features one at a time by performing feature compression of the signal, methods for reducing the dimensions of the features, as well as signal retrieval methods which vary the lengths of the segments according to properties of the signal. It would have been obvious to one of ordinary skill at the time of the invention to modify the system of Kashino to implement dividing the original signal into the sub-signals in a time domain so as not to overlap

with each other or pruning signals that have different lengths which reduce the amount of data of the compressed signal, as was well known in the art, for the purpose of improving processing time and retrieval speeds of the signal retrieval system.

Regarding claim 2, Kashino discloses a signal mapping step of mapping each of the sub-signals which have been obtained by the sub-signal re-creation step by the mapping which has been obtained by the compression-mapping determination step; a projection distance calculation step of calculating, the distance between the sub-signal after the mapping which has been obtained by the signal mapping step, and the sub-signal which has been obtained by the sub-signal re-creation step; and a compressed feature creation step of creating a compressed signal, based upon the respective sub-signals after mapping which have been produced by the signal mapping step and the projection distance which has been produced by the projection distance calculation step (sections 2-4).

Regarding claim 3, Kashino discloses initial sub-signal creation step segments the original signal from the beginning of the original signal, and takes the sub-signal after the segmentation as its resulting sub-signal (section 2.1, 2.2-feature extraction).

Regarding claim 4, Kashino discloses the created sub-signal selection step and the sub-signal re-creation step determine segmentation boundaries in order from the beginning of the original signal (section 2.4 – upper limit of similarity and skip width).

Regarding claim 5, Kashino discloses the created sub-signal selection step and the sub-signal re-creation step set a segmentation boundary shiftable width which is determined in advance, and, taking the segmentation boundary which has been obtained by the initial sub-signal creation step as a reference, determine segmentation boundaries which minimize the

amount of the data of the compressed signal within a segmentation boundary shiftable range having the segmentation boundary shiftable width on both sides of the center thereof (section 2.4 –upper limit of similarity and skip width).

Regarding claim 6, Kashino discloses the created sub-signal selection step shifts the segmentation boundaries to some locations and calculates compression ratios, and, based upon the results thereof, selects a range in which the segmentation boundaries which minimize the amount of the data of the compressed signal can exist (section 2.4-upper limit of similarity and skip width).

Regarding claim 7, Kashino discloses the created sub-signal selection step automatically determines the number of times for calculation of compression ratio in the created sub-signal selection step, so as to reduce the number of times of calculation of compression ratio in the created sub-signal selection step and the sub-signal re-creation step (section 2-4).

Regarding claim 8, Kashino discloses the initial sub-signal creation step extracts features from the original signal, and uses the extracted features, represented as a sequence of multi-dimensional vectors, as a new original signal (section 2.1, 2.2-feature extraction).

Regarding claim 9, Kashino discloses a signal retrieval method for, at any location within a stored signal, which is an original signal which is registered in advance, calculating the distance from a reference signal, which is a signal which is taken as an object, and finding a location from the stored signal which is similar to the reference signal, comprising: the steps which are comprised in the signal compression method as described in Claim 1 (see rejection to claim 1 above); a reference feature extraction step in which a feature is produced from the reference signal (section 2.2-feature extraction); a stored feature extraction step in which a

window upon which attention is focused is set within the stored signal, and in which a feature is produced from the stored signal within the window upon which attention is focused (section 2.2-feature extraction); a reference feature compression step in which a reference feature which has been produced by the reference feature extraction step is compressed, based upon the mapping which has been produced by the compression mapping determination step (section 2.1, 2.2-feature extraction); a feature matching step in which the distance is calculated between a reference compressed signal which has been produced by the reference feature compression step and a stored compressed signal which has been produced from the signal compression step by newly using the feature sequence which has been produced by repeatedly performing the processing of the stored feature extraction step while shifting the window upon which attention is focused (section 2.1 continuing to section 2.5); and a signal detection decision step in which, by comparing together the distance which has been produced by the feature matching step and a search threshold, which is a threshold which corresponds to the distance (section 2.1 continuing to section 2.5), it is decided whether or not the reference signal is present at the location within the stored signal, wherein the processing of the feature matching step and the processing of the signal detection decision step are repeated while shifting the window upon which attention is focused (section 2.1 continuing to section 2.5).

Regarding claim 10, Kashino discloses a distance re-calculation step in which, for the location in the database signal at which it has been decided by the signal detection decision step that the query signal is present, the distance between the feature sequence which has been produced by the reference feature extraction step and the feature sequence which has been produced by the stored feature extraction step is calculated; and a signal detection re-decision

step in which, by comparing together the distance which has been produced by the distance re-calculation step and the search threshold, it is re-decided whether or not the query signal is present at the location of the database signal, wherein the processing of the feature matching step, the signal detection decision step, the distance re-calculation step, and the signal detection re-decision step is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal (section 2.1 continuing to section 4).

Regarding claim 11, Kashino discloses a skip width calculation step in which, based upon the distance which has been calculated by the feature matching step, a Skip width for the window upon Which attention is focused is calculated, and the window upon which attention is focused is shifted by the skip width, wherein the processing of the feature matching step, the signal detection decision step, and the skip width calculation step is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal (section 2.4-upper limit of similarity and skip width).

Regarding claims 12-15 and 20-23, the signal compression device and computer medium claims are similar in scope and content to the signal compression method of claims 1-11, and are therefore rejected under similar rationale.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 24-28, 32-33, 35-36, 38-40, 44, 46-48, 60, and 62-64 are rejected under 35 U.S.C. 102(b) as being unpatentable over Kimura et al, ("Very Quick Audio-Searching: Introducing Global Pruning to the Time-Series Active Search," Proc. of International Conference on Acoustics, Speech and Signal Processing (ICASSP2001), Vol. 3, pp. 1429-1432, Salt Lake City, Utah, USA, May 2001.

7. Kimura discloses a method for quick searching through a long audio stream (a stored signal) to detect and locate a known audio signal (reference signal or query) based on signal similarity.

8. Regarding claim 24, Kimura discloses a signal retrieval method which finds out portions from a database signal which has been registered in advance which are similar to a query signal which is taken as an object, comprising: a query feature extraction step in which a feature is produced from the query signal (section 2.2-feature extraction); a database feature extraction step in which a window upon which attention is focused is set within the database signal, and in which a feature is produced from the database signal within the window upon which attention is focused (section 2: Time Series Active Search (TAS)); a database feature partitioning step in which a feature sequence which has been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused is partitioned ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning); a database feature pruning step in which a representative feature is extracted from the feature sequence which has been obtained after partitioning by the database feature partitioning step, and a representative feature sequence is produced which consists of a smaller number of features ((section 2: Time

Series Active Search (TAS) and section 3: Global Pruning); a feature region extraction step in which a region is produced in which a feature which is included in the partition which has been produced by the database feature partitioning step is present ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning); a feature matching step in which a distance is calculated between a feature sequence which has been produced by the query feature extraction step and a representative feature sequence which has been produced by the database feature pruning step ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning); a distance compensation step in which the distance which has been calculated by the feature matching step is compensated using the region which has been produced by the feature region extraction step ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning); and a signal detection decision step in which, by comparing together the distance which has been produced after compensation by the distance compensation step and a search threshold, which is a threshold which corresponds to the distance, it is decided whether or not the query signal is present at the location within the database signal ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning); and wherein the processing of the feature matching step through the signal detection decision step is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated, and it is determined whether or not the query signal is present at the locations within the database signal ((section 2: Time Series Active Search (TAS) and section 3: Global Pruning: and section 4: Experiments).

Regarding claim 25, Kimura discloses in the database feature pruning step, any single feature in the partition is taken as a representative feature (section 3.2, clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters).

Regarding claim 26, Kimura discloses in the database feature pruning step, the centroid of the features in the partition is taken as a representative feature (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters).

Regarding claim 27, Kimura discloses in the database feature partitioning step. the feature sequence which has been produced by repeatedly performing the processing of the database feature extraction step while shifting the window upon which attention is focused is segmented equally into lengths which have been specified in advance (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters).

Regarding claim 28, Kimura discloses in the database feature partitioning step, the feature sequence which has been produced by repeatedly performing the processing of the database feature extraction step while shifting the window upon which attention is focused is segmented so that the region in which a feature is present which is produced by the feature region extraction step becomes smaller than a maximum region which has been specified in advance (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters).

Regarding claim 32, Kimura discloses a distance re-calculation step in which, for the location in the database signal at which it has been decided by the signal detection decision step that the query signal is present, the distance between the feature which has been produced by the query feature extraction step and the feature sequence which has been produced by the database

feature extraction step is calculated (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters; section 4, Experiments): and a signal detection re-decision step in which, by comparing together the distance which has been produced by the distance re-calculation step and the search threshold, it is again decided whether or not the query signal is present at the location of the database signal (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments), and wherein the processing of the feature matching step, the signal compensation step, the signal detection decision step, the distance re-calculation step, and the signal detection re-decision step is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments).

Regarding claim 33, Kimura discloses a database feature classification step in which the respective features which have been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused are classified based upon a distance which has been defined in advance, and a representative feature of the classification is determined upon (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments); a selection threshold setting step in which a selection threshold for the distance which has been defined by the database feature classification step is calculated from a search threshold which has been defined in advance (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments); and a database feature selection step in which, among the classification

which has been produced by the database feature classification step, a feature is selected which is included in the classification which contains a representative feature such that the distance from the feature which has been produced by the query feature extraction step satisfies a condition which is produced from the selection threshold which has been calculated by the selection threshold setting step (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments).

Regarding claims 35-36 and 38, Kimura discloses implementation of Euclid distance (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments).

Regarding claim 39, Kimura discloses the query feature extraction step and the database feature extraction step classify the features by a method which is determined in advance, create a histogram which is a frequency distribution table for each classification, and output the histogram as a new feature (section 3.2, Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments).

Regarding claim 40, Kimura discloses a skip width calculation step in which, based upon the distance which has been calculated by the distance compensation step, a skip width for the window upon which attention is focused is calculated, and the window upon which attention is focused is shifted by the skip width, and wherein the processing of the feature matching step, the distance compensation step, the signal detection decision step, and the skip width calculation step is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated, and it is determined whether or not the query signal is present at the locations within the database signal (section 3.2,

Clustering of Histograms to 3.3, Global Pruning Using the Histogram Clusters and section 4, Experiments).

Regarding claims 44, 46-48, 60, and 62-64, the signal retrieval device and computer medium claims are similar in scope and content to the signal retrieval method of claims 24-28, 32-33, 35-36, and 38-40 and are therefore rejected under similar rationale.

Allowable Subject Matter

9. Claims 29-31, 34, 37, 45, and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claims 41-43, 49-51, and 65-67 are allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANGELA A. ARMSTRONG whose telephone number is (571)272-7598. The examiner can normally be reached on Monday-Thursday 11:30-8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick N. Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Angela A Armstrong/
Primary Examiner, Art Unit 2626